

Article

# Quality adjusted labour input: UK estimates to 2015

Experimental estimates of labour input used in production, weighting the hours worked by different types of workers by their relative contribution to economic production.

Contact:  
Alexander Blunden and Mark  
Franklin  
productivity@ons.gov.uk  
+44 1633 651 824

Release date:  
6 October 2016

Next release:  
To be announced

## Table of contents

1. [Authors](#)
2. [Abstract](#)
3. [Introduction](#)
4. [What's new?](#)
5. [Some descriptive statistics](#)
6. [Results: whole economy](#)
7. [Comparing whole economy and market sector estimates](#)
8. [Revisions Analysis](#)
9. [Next steps](#)
10. [Quality and methodology](#)
11. [Background notes](#)

# 1 . Authors

Alexander Blunden and Mark Franklin, Office of the Chief Economic Adviser.

## 2 . Abstract

This article presents updated estimates of quality adjusted labour input (QALI) for the whole UK economy alongside new estimates for the market sector. QALI is an input into measuring multi-factor productivity (MFP) which accounts for changes in the composition (or “quality”) of the employed workforce as well as changes in hours worked. The market sector estimates of QALI will be incorporated into MFP estimates in a future publication and reflect [development of industry level market sector estimates for workers, hours worked and labour compensation](#) as set out in an accompanying article.

QALI estimates for 2015 show a decline in the labour composition or “quality” of the workforce in both the whole economy and the market sector. Combined with a deceleration in growth of hours worked, growth of quality adjusted labour in the whole economy was 1.4% in 2015, the slowest since 2011. The decline in labour quality in 2015 followed 2 years of marginal improvement and contrasts with robust improvements in labour quality between 2009 and 2012.

As always we welcome your feedback, which can be addressed to [productivity@ons.gov.uk](mailto:productivity@ons.gov.uk).

## 3 . Introduction

### About this release

This article is the latest in a series presenting [experimental](#) estimates of labour input used in production. Quality adjusted labour input (QALI) differs from traditional measures of labour input as it weights the number of hours worked by different types of workers by their relative contribution to economic production. As a result, the QALI index will be more sensitive to changes in the hours worked of relatively high productivity workers compared with relatively low productivity workers. This is calculated by categorising workers by identifiable characteristics (based on age, sex, industry of employment and level of education) and weighting changes in the hours worked of each worker type by their share of total labour income. The rationale for this approach is that, under competitive markets, economic theory suggests that different factors of production (different categories of workers and different types of capital assets) will be remunerated according to their marginal productivity. Consequently relative shares of labour income provide a proxy for the relative productivity or “quality” of different types of workers.

Using a suitable weighting system, it is possible to subtract movements in hours (sometimes referred to as “unadjusted hours”) from movements in QALI indices and hence to identify the pure “quality” or compositional movement in labour input to production.

From the perspective of measuring productivity, it is the movement in QALI rather than the movement in hours worked which offers a better representation of what is happening to labour input. For example, growth in labour quality of 1% with hours unchanged, is equivalent (abstracting from distributional effects) to growth in hours worked of 1%, with labour quality unchanged.

## Layout of the article

The rest of this article is structured as follows. Section 4 describes what is new in this edition, summarising the main changes to sources and to the methodology. Section 5 presents summary statistics illustrating the main features of the Office for National Statistics (ONS) QALI system.

Section 6 outlines the results for the whole economy and Section 7 explores the differences between the market sector and whole economy estimates. Section 8 then discusses revisions to the estimates from the previous [QALI publication in May 2015](#) and revisions from QALI estimates used in the latest [multi-factor productivity \(MFP\) publication in May 2016](#). Finally Section 9 discusses next steps.

Detailed estimates are available in [downloadable datasets](#) accompanying this article.

## 4 . What's new?

The principal development from previous quality adjusted labour input (QALI) releases is the introduction of detailed estimates of market sector QALI at the same level of industry detail as the whole economy. Previously market sector estimates of QALI were published at an aggregate level and industry level estimates were backed out of this by assuming that all of the difference between the whole economy and the market sector was accounted for by a single, heavily aggregated, industry group. For this release we have developed market sector industry estimates that are consistent with our measures of market sector gross value added (GVA) and our sectoral financial accounts. This is in response to our shift in focus to market sector estimates of [volume indices of capital services \(VICS\)](#) and [MFP](#).

An [accompanying article](#) sets out the full methodology behind the new industry-level market sector estimates. In brief, we compile industry-level estimates of market sector employment, hours worked and labour remuneration using a combination of estimates of general government employment by industry, estimates derived from the Labour Force Survey (LFS) on individual's employer type, as well as information from our sector and financial accounts.

There are differences between whole economy and market sector estimates (that is, there are non-zero non-market sector labour inputs) in 6 out of the 10 industries reported in this release, although in several of these the differences are fairly small. Section 7 will explore the differences between the 2 measures in more detail.

This edition incorporates Annual Population Survey revisions to LFS estimates back to Quarter 3 (July to Sept) 2012 and industry-level income constraints from Blue Book 2016. The latter, together with methodological changes described in Section 8, generate revisions throughout the QALI series.

One consequence of the shift in focus to the market sector is that we have lost a year at the start of the time series. QALI estimates now start in 1994 (growth rates from 1995). This is because the LFS variable used to identify non-market parameters was not introduced until 1994. It is still possible to compile whole economy QALI from 1993, but to assist comparison between the 2 QALI frameworks we do not report 1993 in this release.

The detailed methodology otherwise used within QALI has not changed in this publication and it can be found in full in [Acheson and Franklin \(2012\)](#).

## 5 . Some descriptive statistics

Conceptually, quality adjusted labour input (QALI) is simply a weighting of hours worked where the weights are theoretically proportional to productivity levels. In this framework, QALI will grow at a different rate to total hours worked – a simple measure of the quantity of labour supplied – when 2 conditions are met. First, the weights of different categories of the employed workforce need to differ from one another. And second, growth rates of hours worked of different QALI categories also need to vary. The effect of these conditions is to make the QALI index more sensitive to changes in the labour supplied by relatively high productivity workers than relatively low productivity workers, capturing changes in the composition of the workforce.

Table 1 shows that both of these conditions are met. The left hand panel of the table shows relative remuneration in 2007 and 2015, summarised over the different QALI categories and expressed relative to the in-year average for the UK as a whole. Since weights are defined as shares of total remuneration, these data show that the relative weights are not uniform and also that weightings have changed over time, reflecting movements in supply and demand for different categories of labour.

Table 1 also offers some evidence that remuneration differentials have narrowed over time. The differentials for relatively high reward industries such as K and J were lower in 2015 than in 2007 (indicating a smaller difference between earnings in these industries and the UK average), while differentials for relatively low reward industries GI, F and RSTU were a little higher in 2015 than in 2007. On the other hand, differentials for LMN (below average) fell between these dates and differentials for C (above average) increased a little. There has been a small narrowing of the pay differential between sexes according to these estimates and a comparatively large movement across the age distribution, away from the youngest cohort and towards the oldest cohort, whose relative remuneration in 2015 was the highest of the 3 age cohorts for the first time on record.

As in previous releases, the QALI dataset shows a strong link between levels of education and relative hourly remuneration, although this has tended to diminish over time, possibly reflecting [large increases in the proportion of the population entering tertiary education](#). The premium earned by the highest education cohort (masters and doctorates) was lower in 2015 than in 2007 but it was actually higher than in 2013 and 2014. The premiums for workers with first and other degrees and with certificates of education or their equivalents were the lowest on record in 2015.

**Table 1: Relative hourly remuneration and shares of hours worked**

2007 and 2015, UK, Whole Economy

Industry	Hourly remuneration		Shares of hours worked (%)	
	2007	2015	2007	2015
Agriculture, forestry and fishing; mining and quarrying; utilities (ABDE)	104.1	100.0	2.7	3.0
Manufacturing (C)	114.7	124.2	10.8	9.3
Construction (F)	81.7	86.2	8.6	7.9
Wholesale and retail trade; accommodation and food services (GI)	74.9	78.7	20.3	20.1
Transportation and storage (H)	104.6	112.9	5.3	4.8
Information and communication (J)	143.1	133.2	4.4	4.7
Financial and insurance activities (K)	199.3	173.5	4.0	3.8
Real estate activities; professional and scientific activities; administrative and support activities (LMN)	84.6	80.6	16.7	18.4
Public administration and defence; education; health and social work (OPQ)	110.8	109.2	22.3	23.1
Arts and entertainment; other services (RSTU)	79.0	92.3	4.8	4.9
Sex				
Females	90.7	92.1	38.8	38.9
Males	105.9	105.0	61.2	61.1
Age				
16 to 29 years	72.3	68.1	24.8	23.4
30 to 49 years	111.9	109.5	50.4	48.1
50 and over	103.4	110.1	24.9	28.5
Education				
No qualifications	65.9	68.2	8.3	5.3
GCSEs or equivalent	80.9	77.8	33.2	27.8
A – levels or trade apprenticeships	92.3	89.4	23.8	23.2
Certificates of education or equivalent	111.6	104.6	9.5	9.5
First and other degrees	132.8	121.8	17.5	23.2
Masters and doctorates	154.4	144.0	7.7	10.9

Source: Office for National Statistics

Notes:

1. Hourly remuneration, Whole economy = 100

The right-hand panel of Table 1 reports shares of hours worked. Movements in shares across industries reflect a continued decline in the share of labour input accounted for by manufacturing and the rise of certain service industries including LMN and OPQ.

The balance between the sexes has shown little change in terms of shares of hours worked, but there has been a distinct shift in age composition. The share of labour input accounted for by the oldest age cohort is the highest on record in 2015, likely reflecting growing [labour market participation](#) among this group – possibly reflecting changes to retirement ages and the growing prevalence of [self-employment](#) in particular among these workers. There has also been a pronounced shift in the distribution of hours worked by level of education, particularly among the highest and lowest qualified. The share of hours worked of the highest 2 categories increased by almost 9 percentage points between 2007 and 2015, mirrored by a similar fall in the shares of the lowest 2 education categories.

## 6 . Results: whole economy

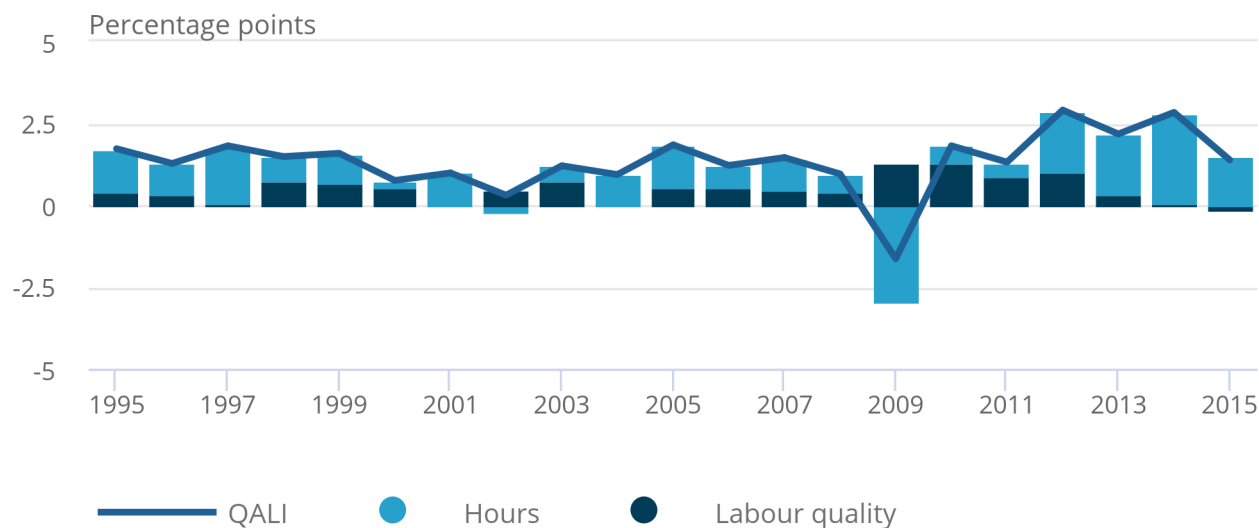
Figure 1 shows the annual changes in whole economy quality adjusted labour input (QALI) and the contributions of hours worked and labour quality for 1995 to 2015. The labour quality contribution was negative in 2015, continuing a downward trend since 2012 and the first negative contribution from labour quality since 2001. This means that almost all of the growth in QALI over 2013 to 2015 has come from rising hours worked, in marked contrast to the period 2009 to 2012 when all of the growth in QALI came from improvements in quality.

**Figure 1: Annual QALI growth, whole economy**

UK, 1995 to 2015

Figure 1: Annual QALI growth, whole economy

UK, 1995 to 2015



Source: Office for National Statistics

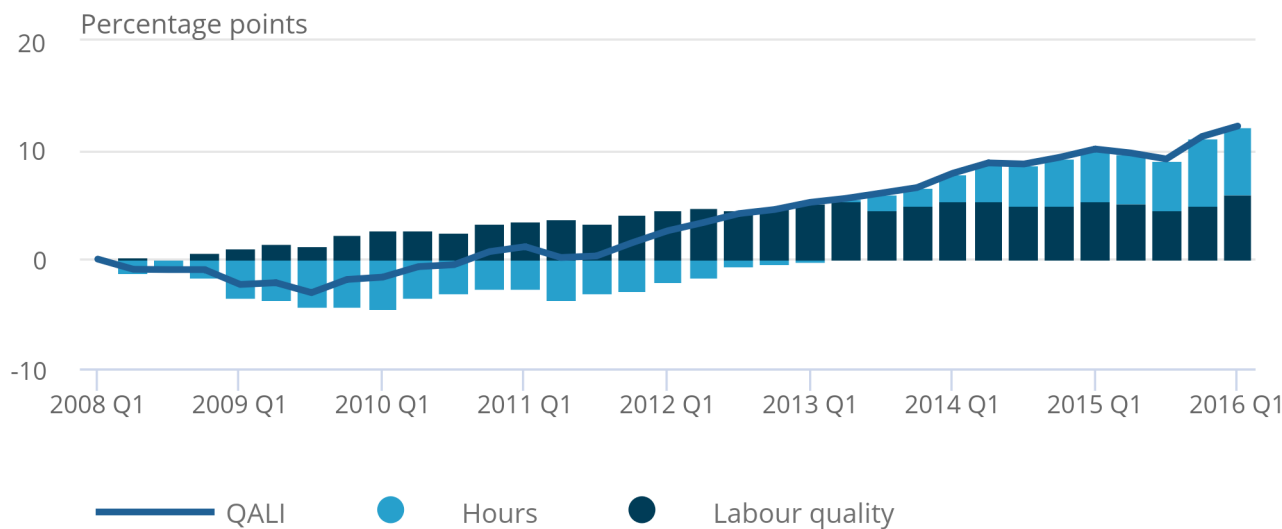
This is reinforced in Figure 2 which shows cumulative quarterly growth in QALI and its constituents for the whole economy. Apart from a short plateau in the middle of 2015, hours worked have been on a strong upward trajectory since Quarter 2 (Apr to June) 2011. Labour quality improved during the economic downturn, as the impact of job losses and reduced hours fell disproportionately on younger and less well-qualified workers. However, labour quality has shown essentially no further improvement since the middle of 2012, with all of the increase in QALI since then accounted for by rising hours worked.

Figure 2: Cumulative QALI quarterly growth, whole economy

UK, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2016, 2008 Q1=100

Figure 2: Cumulative QALI quarterly growth, whole economy

UK, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2016, 2008 Q1=100



Source: Office for National Statistics

Figure 3 shows annual QALI growth and its contributions for the whole economy by industry. There is a high degree of variability by industry but there are some main trends. Those industries which are growing strongly are almost entirely driven by the growth in hours and in the case of the 2 fastest growing industry groupings, F (construction) and LMN (real estate, professional services and administration services) these are experiencing negative quality growth. ABDE (production) and H (transport) are outliers with negative growth in hours.

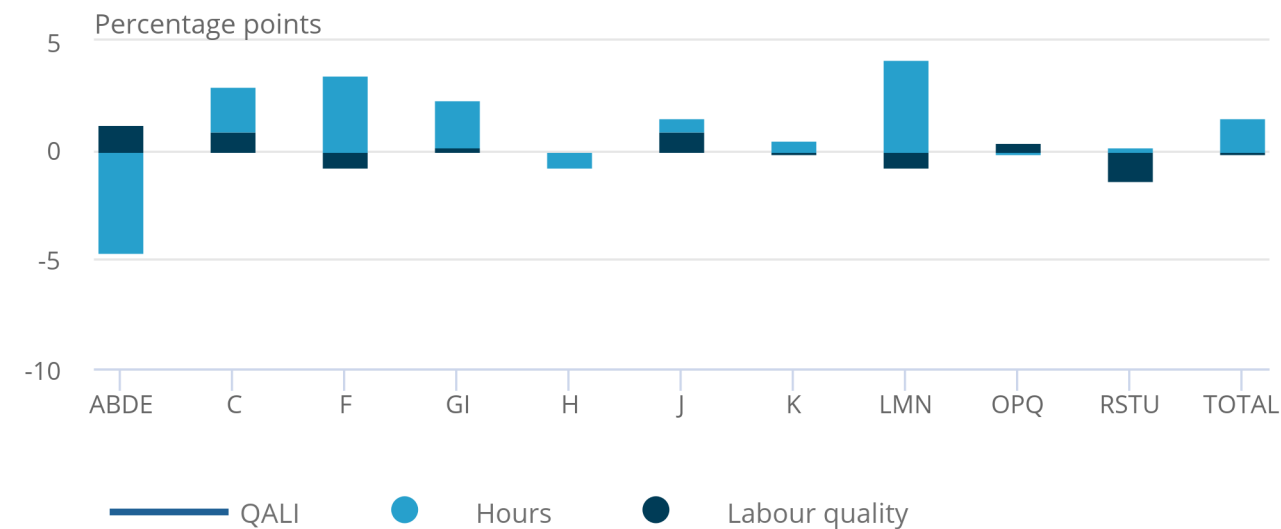


Figure 3: QALI growth by industry, whole economy breakdown

UK, 2015

Figure 3: QALI growth by industry, whole economy breakdown

UK, 2015



Source: Office for National Statistics

Notes:

1. ABDE refers to Agriculture, forestry and fishing; mining and quarrying; utilities, C refers to Manufacturing, F refers to Construction, GI refers to Wholesale and retail trade; accommodation and food services, H refers to Transportation and storage, J refers to Information and communication, K refers to Financial and insurance activities, LMN refers to Real estate activities; professional and scientific activities; administrative and support activities, OPQ refers to Public administration and defence; education; health and social work, RSTU refers to Arts and entertainment; other services.

Figure 4 shows average annual QALI growth by industry between 2008 and 2015, that is, since the economic downturn. In contrast to the single year estimates for 2015 (Figure 3), labour quality has made a positive contribution to QALI growth across all industries over this period. Hours worked also make a positive contribution in all but 3 industries.

Industry K (financial services) has seen the strongest average contributions from labour quality (1.2 percentage points per year), accounting for almost all of the increase in QALI since growth in hours worked has averaged only 0.1 percentage point per year. Industry F (construction) experienced the weakest contribution of labour quality to QALI growth over this period – although this contribution was more than sufficient to offset a decline in hours worked.

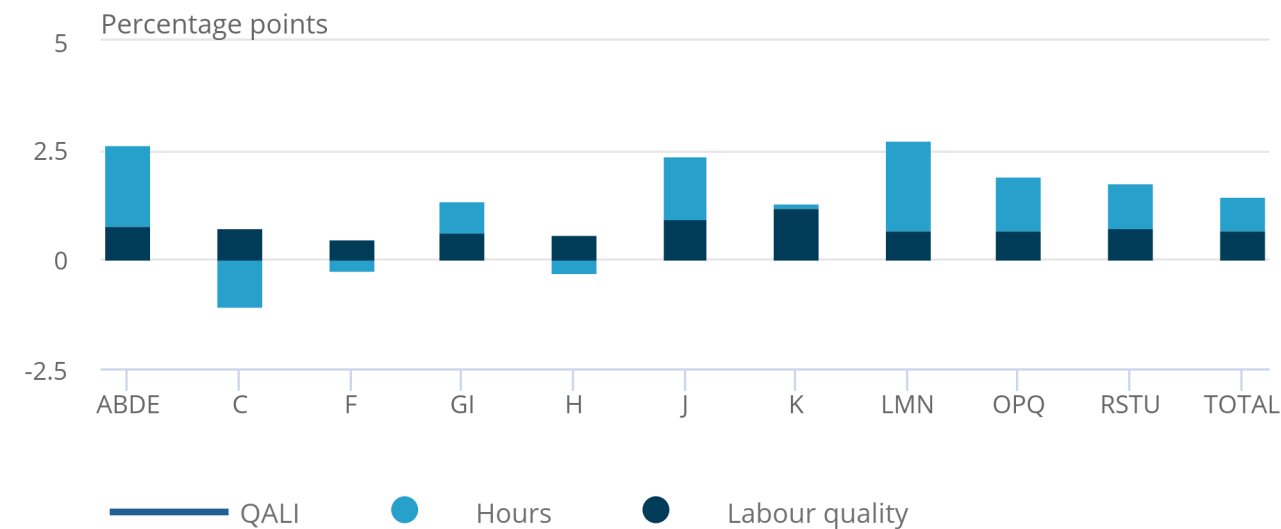
Growth of hours worked is considerably more variable across industries than the contributions from labour quality. Industries LMN, ABDE and J have exhibited the fastest growth of hours worked, while industries C, H and F have exhibited falling hours on average, although in the case of industries C and F this masks steep falls during the economic downturn. Hours growth in construction has been relatively robust since 2012 and hours worked in manufacturing have grown in 5 of the last 6 years.

Figure 4: QALI average growth by industry, whole economy breakdown

UK, 2008 to 2015 annual averages

Figure 4: QALI average growth by industry, whole economy breakdown

UK, 2008 to 2015 annual averages



Source: Office for National Statistics

Notes:

1. ABDE refers to Agriculture, forestry and fishing; mining and quarrying; utilities, C refers to Manufacturing, F refers to Construction, GI refers to Wholesale and retail trade; accommodation and food services, H refers to Transportation and storage, J refers to Information and communication, K refers to Financial and insurance activities, LMN refers to Real estate activities; professional and scientific activities; administrative and support activities, OPQ refers to Public administration and defence; education; health and social work, RSTU refers to Arts and entertainment; other services.

As noted previously there has been a substantial increase in the share of hours worked by people with higher qualifications over recent years. This trend continued in 2015 as a result of a large increase in the hours of work supplied by the highest educated group (masters and doctorates) as shown in Figure 5. The QALI index for this group grew by almost 14% in 2015 – of which the growth in the number of hours supplied was by far the largest contributor. This development came alongside a sizeable fall in hours worked by the next highest cohort of first degree holders: among this group, both quality and hours worked contributed to a fall in the QALI index.

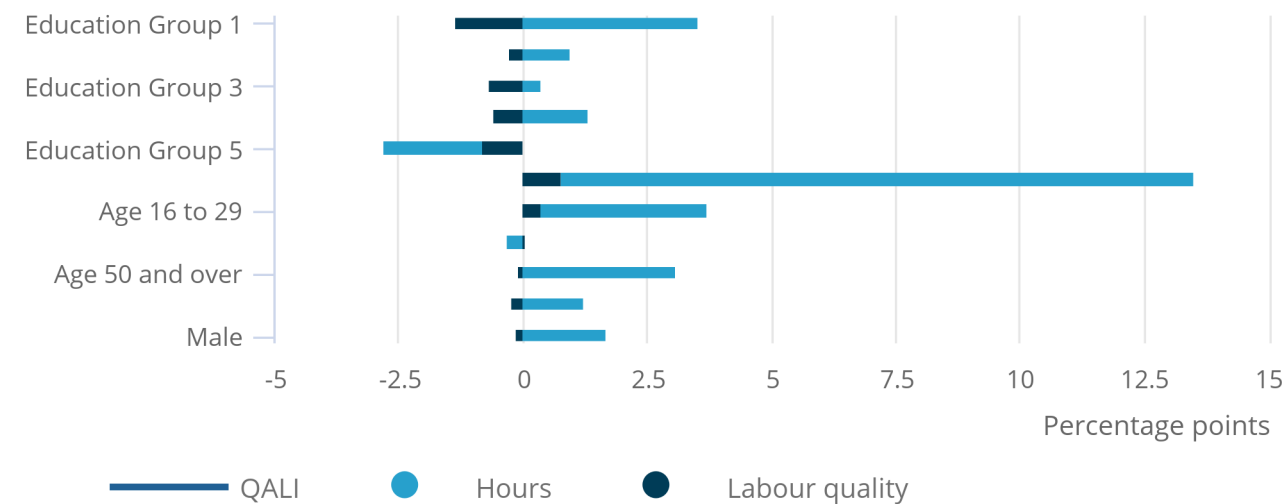
Indeed, labour quality fell across all education groups in 2015 except the highest. There is typically not much impact from labour quality when aggregated by age and sex. Intuitively this is because these are large sub-samples of the population, with fairly stable distributions across the remaining QALI categories.

Figure 5: QALI growth by education, age and sex, whole economy breakdown

UK, 2015

Figure 5: QALI growth by education, age and sex, whole economy breakdown

UK, 2015



Source: Office for National Statistics

Notes:

1. Key to Education Groups: 1: No qualifications 2: GCSEs or equivalent 3: A-levels or trade apprenticeships 4: Certificates of education or equivalent 5: First and other degrees 6: Masters and doctorates.

It is worth emphasising the positive contribution of labour quality for the highest education group in 2015. This means that, despite the rapid growth in supply of labour with masters and doctorates, there is no evidence in the most recent year that relative remuneration of this cohort has been squeezed. In this year, the earnings differential between those with masters and doctorates and the average for the UK as a whole increased.

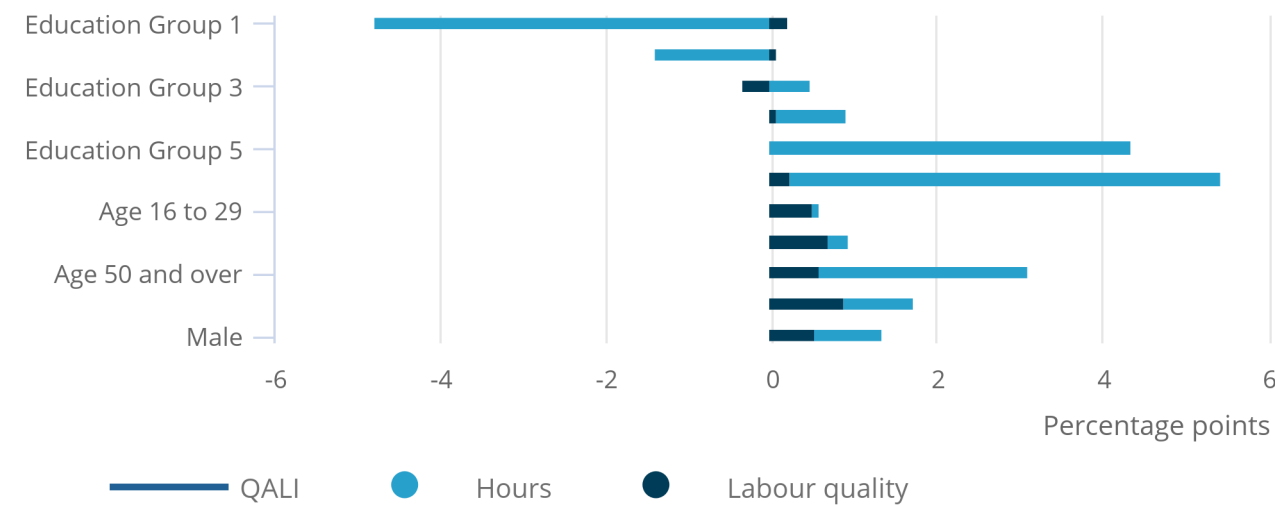
These single year estimates for 2015 in Figure 5 contrast somewhat with recent experience. Figure 6 shows equivalent growth rates and contributions to QALI in annual average terms over the period 2008 to 2015. This shows a strikingly regular pattern across the education categories, dominated by different growth rates for hours worked. Combined with the pattern of pay differentials shown in Table 1 this is the main driver of improvements in labour quality at the aggregate level and across industries. Figure 6 also shows notable differences across the QALI age categories, again largely reflecting different rates of growth of hours worked. There is also some evidence that labour quality of females has grown a little faster than that of males over this period.

Figure 6: QALI average growth by education, age and sex, whole economy breakdown

UK, 2008 to 2015 annual averages

Figure 6: QALI average growth by education, age and sex, whole economy breakdown

UK, 2008 to 2015 annual averages



Source: Office for National Statistics

Notes:

1. Key to Education Groups: 1: No qualifications 2: GCSEs or equivalent 3: A-levels or trade apprenticeships 4: Certificates of education or equivalent 5: First and other degrees 6: Masters and doctorates.

## 7 . Comparing whole economy and market sector estimates

Alongside information on the quality of labour index for the whole economy, this release contains the first estimates from a new quality adjusted labour input (QALI) model of the market sector. As previously discussed, the full methodological changes for the construction of market sector estimates are laid out in the [accompanying methods article](#). The market sector model uses a sub-sample of LFS microdata as well as different industry-level constraints (on hours worked and labour income) for those industries with non-zero non-market sector activity. These differences result in different QALI estimates for industries with non-market components and for other QALI aggregates.

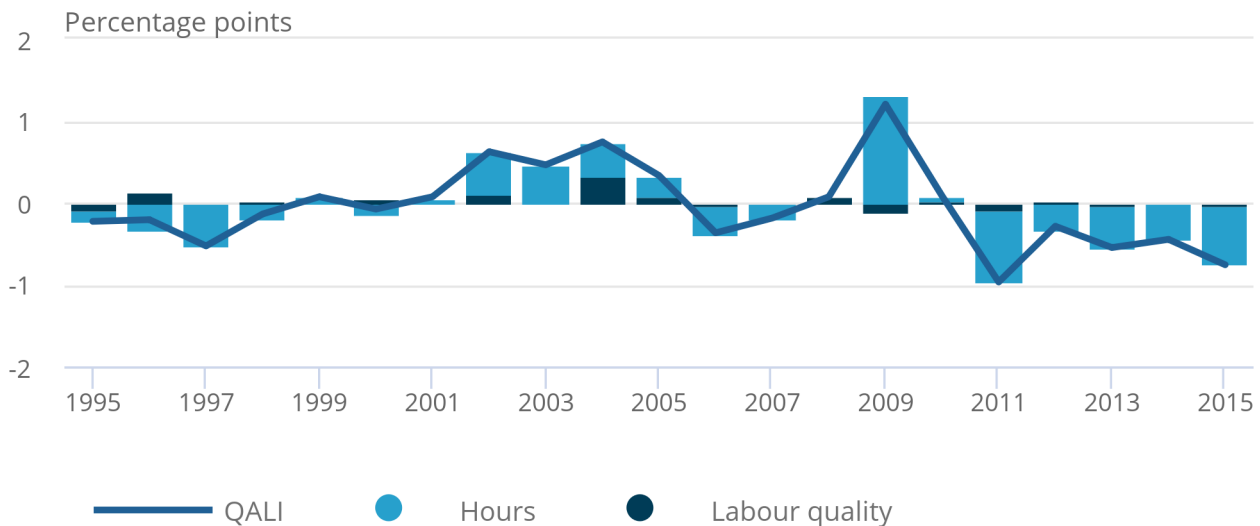
Figure 7 shows annual QALI growth, expressed as differences between the aggregate whole economy estimates (as in Figure 1) and the equivalent estimates for the aggregate market sector using the new market sector framework. Points above (below) the horizontal axis therefore indicate that the quality of labour index grew more quickly (slowly) in the whole economy than in the market sector. Figure 7 suggests that differences in growth rates are generally less than 1% – only exceeding this threshold in 2009 – and are dominated by differences in growth of hours worked. The relatively large difference in 2009 reflects market sector hours falling more sharply during the economic downturn than in the economy as a whole, although it is noteworthy that hours worked in the whole economy have grown less rapidly than market sector hours in each of the last 5 years.

**Figure 7: Difference in annual QALI growth**

Whole economy minus market sector, UK, 1995 to 2015

Figure 7: Difference in annual QALI growth

Whole economy minus market sector, UK, 1995 to 2015



Source: Office for National Statistics

Notes:

1. Differences between whole economy estimates and market sector estimates, (WE-MS)

Figure 8 focuses in on quarterly differences during and after the economic downturn. This highlights the initial outperformance of hours worked across the whole economy metrics during the economic downturn (that is, hours fell faster in the market sector than in the economy as a whole). Since 2011 however, market sector hours have grown faster and there has been a little more quality improvement in the market sector than in the economy as a whole.

Figure 8: Differences in cumulative quarterly QALI growth

Whole economy minus market sector, UK, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2016, 2008 Q1=100

Figure 8: Differences in cumulative quarterly QALI growth

Whole economy minus market sector, UK, Quarter 1 (Jan to Mar) 2008 to Quarter 1 2016, 2008 Q1=100



Source: Office for National Statistics

Notes:

1. Differences between whole economy estimates and market sector estimates, (WE-MS).

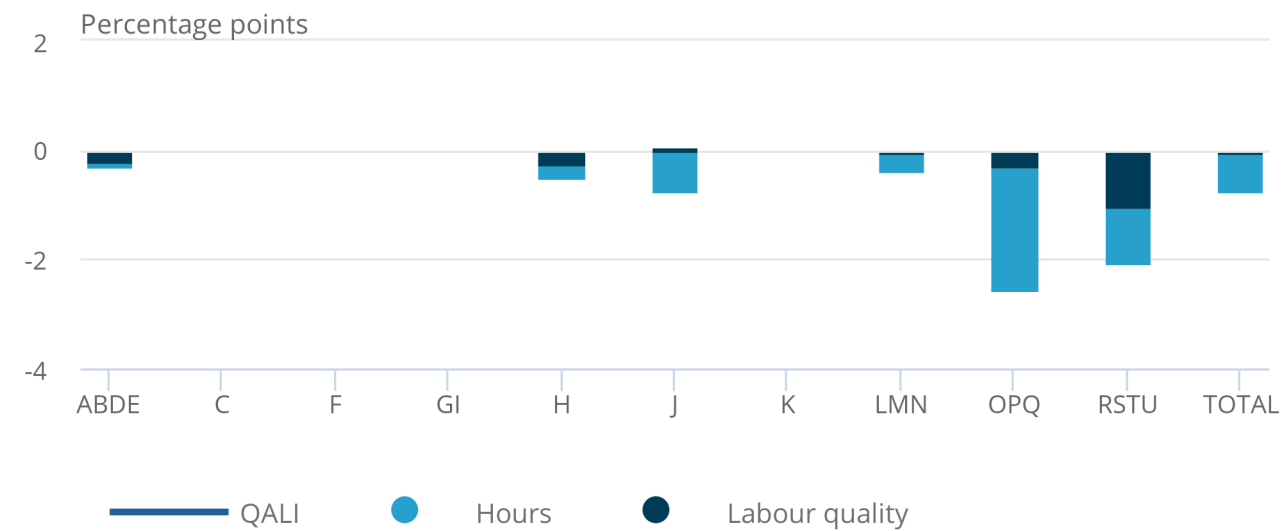
Figure 9 shows differences in QALI results for 2015 between the whole economy and the market sector by industry, expressed as differences in growth rates. Naturally there are zero differences for those industries that are entirely market sector. For other industries the market sector estimates almost universally display faster growth (so the differences are negative). In particular there are sizeable differences in the growth of hours worked in OPQ, RSTU and J, and marked differences in growth of labour quality especially in RSTU.

Figure 9: Differences in QALI growth by industry

Whole economy minus market sector, UK, 2015

Figure 9: Differences in QALI growth by industry

Whole economy minus market sector, UK, 2015



Source: Office for National Statistics

Notes:

1. Differences between whole economy estimates and market sector estimates, (WE-MS).
2. ABDE refers to Agriculture, forestry and fishing; mining and quarrying; utilities, C refers to Manufacturing, F refers to Construction, GI refers to Wholesale and retail trade; accommodation and food services, H refers to Transportation and storage, J refers to Information and communication, K refers to Financial and insurance activities, LMN refers to Real estate activities; professional and scientific activities; administrative and support activities, OPQ refers to Public administration and defence; education; health and social work, RSTU refers to Arts and entertainment; other services.

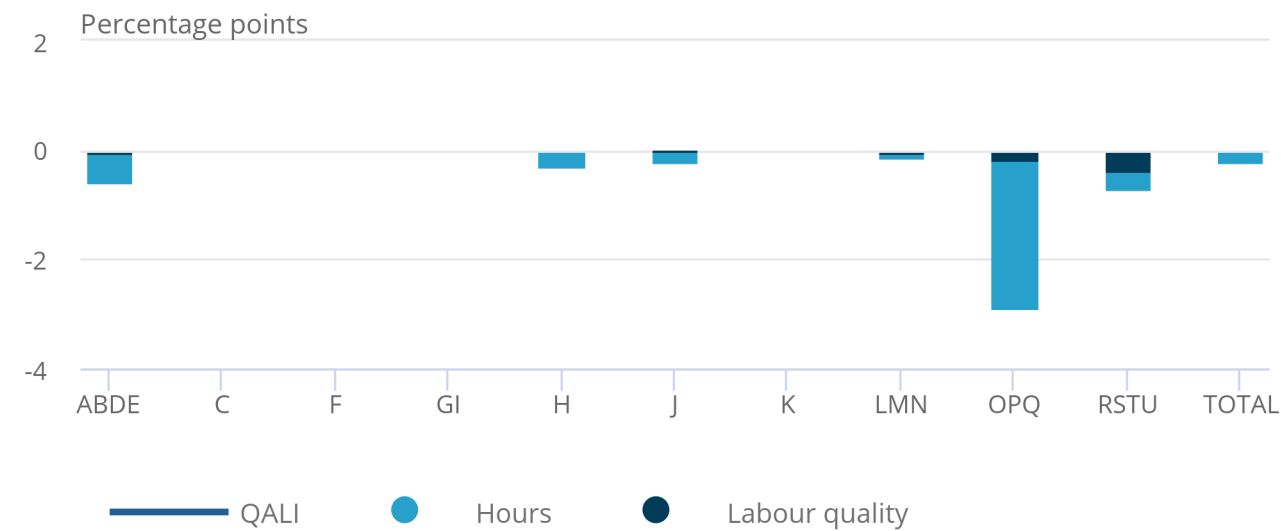
These single year estimates are broadly comparable to the experience since the onset of the economic downturn in 2008. Figure 10 shows differences in annual growth rates over the period 2008 to 2015. It is clear that there has been faster growth of hours worked and, to a lesser extent, of labour quality in the market sector segment of industry OPQ and faster growth of labour quality in RSTU.

Figure 10: Differences in average annual QALI growth by industry

Whole economy minus market sector, UK, 2008 to 2015

Figure 10: Differences in average annual QALI growth by industry

Whole economy minus market sector, UK, 2008 to 2015



Source: Office for National Statistics

Notes:

1. Differences between whole economy estimates and market sector estimates, (WE-MS).
2. ABDE refers to Agriculture, forestry and fishing; mining and quarrying; utilities, C refers to Manufacturing, F refers to Construction, GI refers to Wholesale and retail trade; accommodation and food services, H refers to Transportation and storage, J refers to Information and communication, K refers to Financial and insurance activities, LMN refers to Real estate activities; professional and scientific activities; administrative and support activities, OPQ refers to Public administration and defence; education; health and social work, RSTU refers to Arts and entertainment; other services.

Alongside these differences between the market sector and whole economy QALI results by industry, there are differences for several groupings of workers. Figure 11 shows the difference in QALI growth in 2015 between the whole economy and market sector frameworks for other QALI categories. As with differences by industry (Figures 9 and 10), market sector growth rates are generally faster, especially for the highest education group, for the middle age cohort and for females. Most of the differences are due to hours worked, with only small differences in movements in labour quality.

Differences in growth rates are less pronounced when averaged over the period 2008 to 2015 (Figure 12). The extent to which market sector labour input has outpaced that of the whole economy is tilted towards higher education groups (not just the highest), to the middle and older age cohorts and to females. However, deployment of the youngest age cohort has grown a little faster in the whole economy than in the market sector over this period.

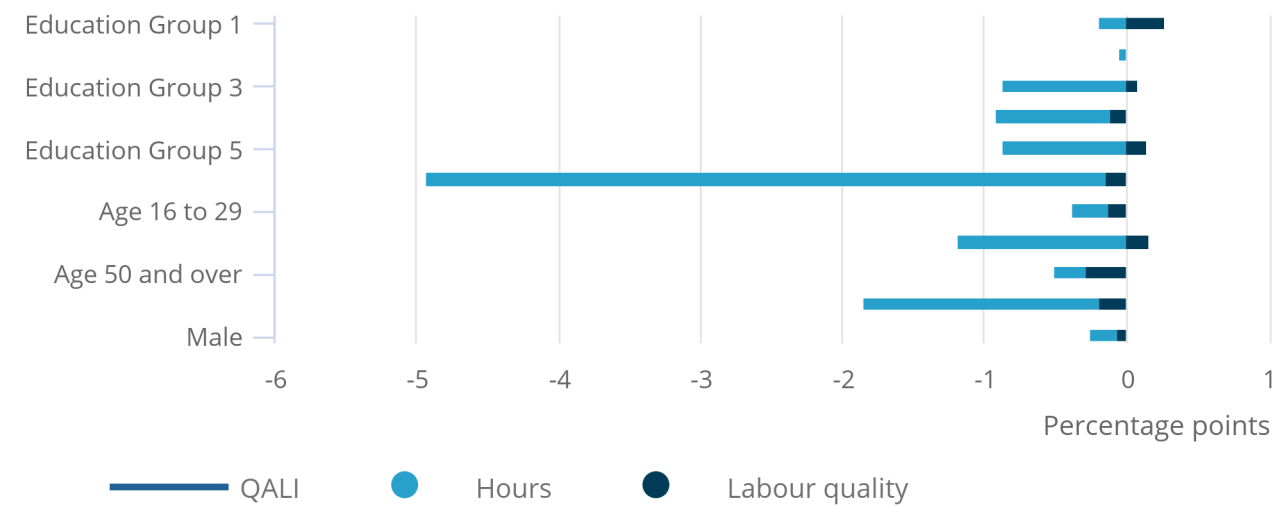


Figure 11: Differences in QALI growth by education, age and sex

Whole economy minus market sector, UK, 2015

Figure 11: Differences in QALI growth by education, age and sex

Whole economy minus market sector, UK, 2015



Source: Office for National Statistics

Notes:

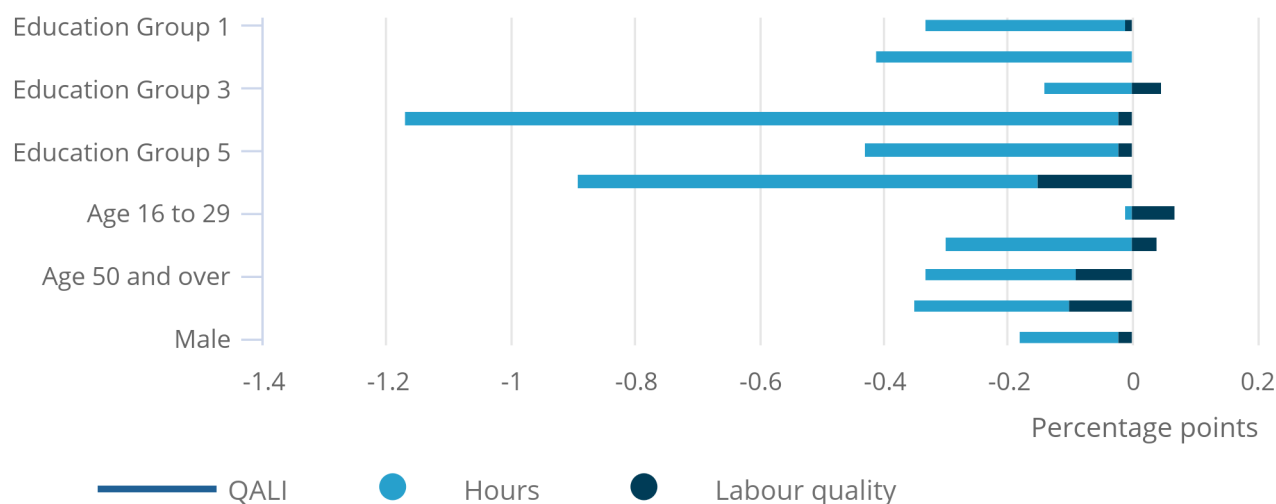
1. Differences between whole economy estimates and market sector estimates, (WE-MS).
2. Key to Education Groups: 1: No qualifications 2: GCSEs or equivalent 3: A-levels or trade apprenticeships 4: Certificates of education or equivalent 5: First and other degrees 6: Masters and doctorates.

**Figure 12: Differences in average annual QALI growth by education, age and sex**

Whole economy minus market sector, UK, 2008 to 2015

## Figure 12: Differences in average annual QALI growth by education, age and sex

Whole economy minus market sector, UK, 2008 to 2015



Source: Office for National Statistics

Notes:

1. Differences between whole economy estimates and market sector estimates, (WE-MS).
2. Key to Education Groups: 1: No qualifications 2: GCSEs or equivalent 3: A-levels or trade apprenticeships 4: Certificates of education or equivalent 5: First and other degrees 6: Masters and doctorates.

## 8 . Revisions Analysis

This section looks at revisions on a whole economy basis since the last quality adjusted labour input (QALI) release in May 2015. We also touch on revisions to the market sector results compared with the QALI estimates used in the market sector multi-factor productivity (MFP) release in May 2016.

## Revisions since May 2015

Revisions since May 2015 reflect revisions to Labour Force Survey (LFS) population weights and to industry level constraints. Updated population weights have only a marginal effect on QALI results. Industry-level income constraints have been revised to align with annual estimates from the Office for National Statistics (ONS) supply-use tables and updated from Blue Book 2014 to Blue Book 2016 vintage. This has led to large shifts in shares of labour income towards industries H (transportation and storage), C (manufacturing) and ABDE (agriculture, forestry and fishing; non-manufacturing production) and away from industries GI (wholesale and retail trade; accommodation and food services) and J (information and communication). For example, the share of labour income of manufacturing in 2014 has increased to 11.6% in this release, compared with 9.2% in the previous release, while the share of wholesale and retail trade; accommodation and food services has fallen to 15.8% compared with 17.9% in the previous release. Revisions to industry-level hours worked are smaller and reflect the LFS revisions noted previously and a methodological change to benchmark hours worked to aggregate seasonally adjusted estimates.

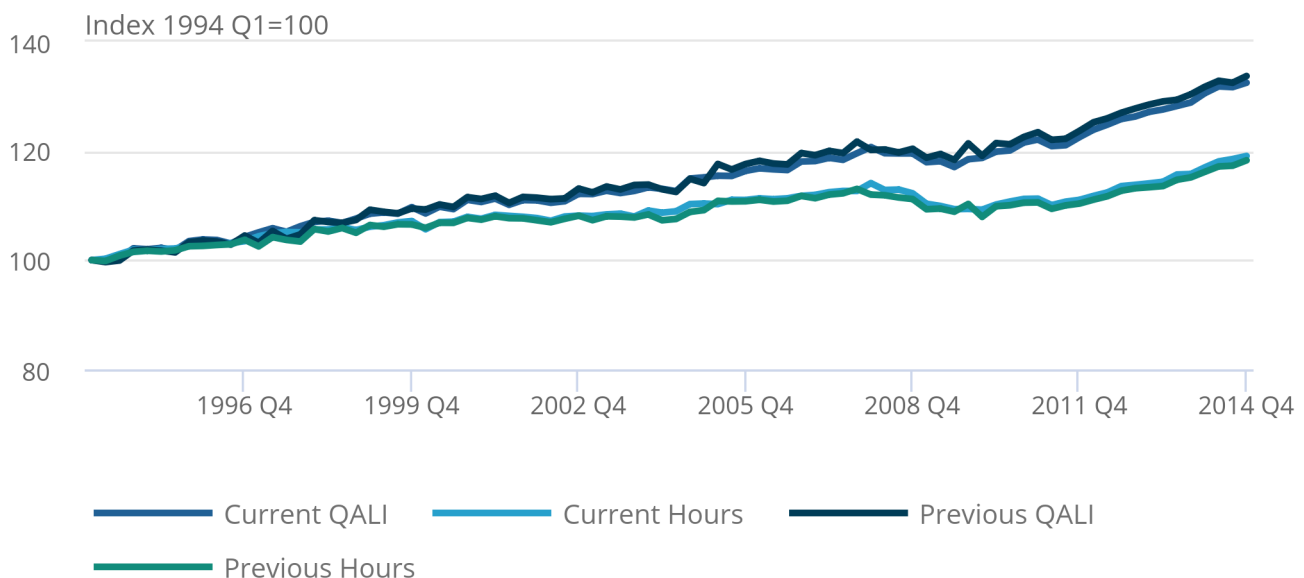
Revisions to the whole economy QALI series are shown in Figure 13. Overall hours growth has been revised up slightly, but the overall QALI index has been revised down, implying downward revisions to labour quality. This is primarily due to revised income weights which have the net effect of reducing the weight of higher remunerated segments of the employed labour force. Further analysis of revisions is available in the [downloadable dataset](#) accompanying this release.

**Figure 13: Whole economy QALI: current and previous**

UK, Quarter 1 (Jan to Mar) 1994 to Quarter 1 2014

Figure 13: Whole economy QALI: current and previous

UK, Quarter 1 (Jan to Mar) 1994 to Quarter 1 2014



Source: Office for National Statistics

Notes:

1. Previous QALI refers to QALI estimates to 2014, published in 2015.

## Revisions since May 2016

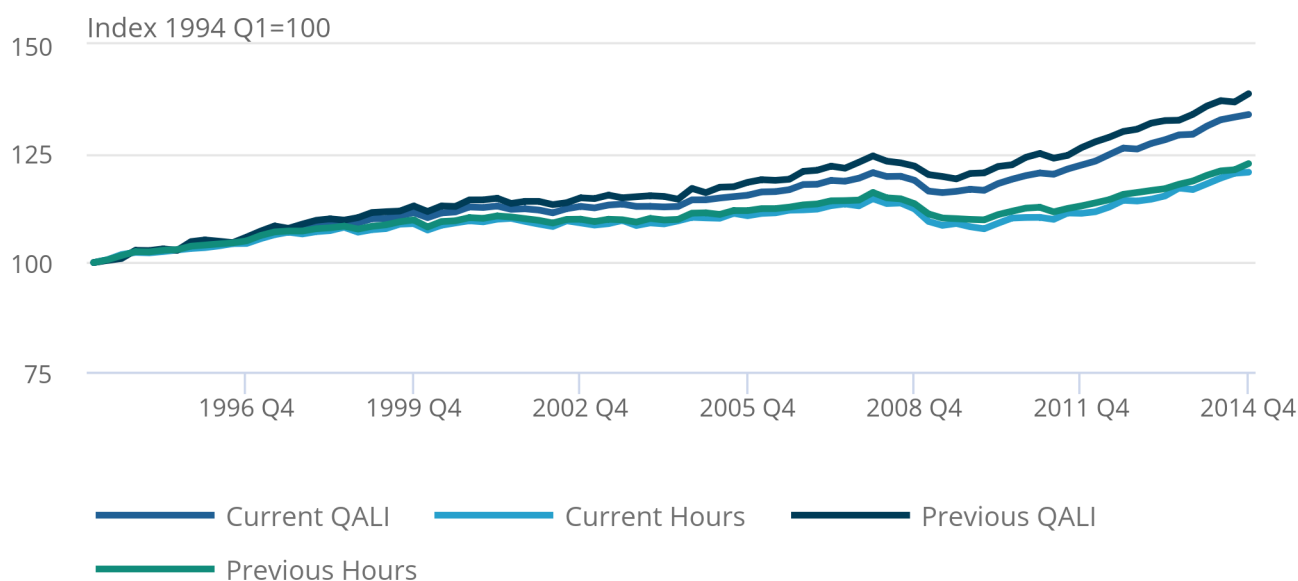
Figure 14 shows QALI results for the market sector in this release compared with the market sector aggregate estimate used in the May 2016 MFP release. Revisions are larger than for the whole economy estimates. This is unsurprising given the fundamental rebuild described in the [accompanying article](#).

**Figure 14: Market sector QALI: current and previous**

UK, Quarter 1 (Jan to Mar) 1994 to Quarter 1 2014

### Figure 14: Market sector QALI: current and previous

UK, Quarter 1 (Jan to Mar) 1994 to Quarter 1 2014



Source: Office for National Statistics

**Notes:**

1. Previous QALI refers to QALI estimates to 2014, published in 2016.

## 9 . Next steps

As noted previously, we intend to use the industry level market sector quality adjusted labour input (QALI) estimates from this release in a future multi-factor productivity (MFP) release of estimates up to 2015, currently scheduled for publication in April 2017. Our [Economic Statistics and Analysis Strategy](#) published in September 2016 states that we will develop a methodology for compiling quarterly estimates of MFP. The first such quarterly estimates are currently scheduled for publication in January 2018.

In the meantime, we have identified 2 inter-related further development priorities for QALI. One is to use estimates from the Annual Survey of Hours and Earnings (ASHE) to improve the precision of our relative remuneration weights. Our current intention is to benchmark Labour Force Survey (LFS) self-reported hourly earnings by industry, age, sex and occupation to ASHE hourly earnings for the same categories and use LFS estimates of hourly earnings by occupation and education to partition earnings across education categories. Early results are encouraging but some hurdles remain. For example, partitioning LFS by occupation as well as by education creates a large number of empty cells, some of which will need to be filled by estimation. Also ASHE is an annual survey, while the QALI framework is quarterly.

The second development is that using ASHE should allow us to expand the QALI industry granularity. We are currently planning for single letter industry level granularity for all industries except S (other service activities), T (activities of households as employers) and U (activities of extra-territorial bodies).

Separately the development of industry level market sector labour metrics will allow us to develop QALI estimates for the non-market sector. Such estimates would allow direct comparisons between market sector and non-market sector labour inputs by industry and potentially offer new insights into productivity. We welcome your feedback on the value of such estimates.

## 10 . Quality and methodology

Full details of the [methodology used for quality adjusted labour input](#) can be found in the accompanying article.

## 11. Background notes

Details of the [policy governing the release of new data](#) are available by visiting the [UK Statistics Authority website](#).